**In the Claims:**

**Please cancel claims 1-19 without prejudice or disclaimer of the subject matter contained therein.**

Claims 1-19 (Canceled).

**Please add the following new claims:**

20. (New) A method for operating MIMO air interfaces in mobile communication systems, the method comprising:

transmitting from a transmitting device a radio signal over a MIMO channel comprising a number of m sub channels;

receiving the radio signal;

assigning different polarizations to the signals that are to be transmitted and received on the sub channels;

mutually conducting to a superimposed antenna the radio signals of all sub channels, the antenna comprising several spatially closely adjacent partial antennas.

21. (New) The method according to claim 20, wherein the partial antennas have phase centers which coincide.

22. (New) The method according to claim 20, and further comprising governing the assignment of the polarizations of the radio signals sent out on the sub channels by a control facility.

23. (New) The method according to claim 21, and further comprising governing the assignment of the polarizations of the radio signals sent out on the sub channels by a control facility.

24. (New) The method according to claim 20, and further comprising altering the polarizations of the signals sent out on the sub channels in predetermined intervals of time.

25. (New) The method according to claim 21, and further comprising altering the polarizations of the signals sent out on the sub channels in predetermined intervals of time.

26. (New) The method according to claim 22, and further comprising altering the polarizations of the signals sent out on the sub channels in predetermined intervals of time.

27. (New) The method according to claim 20, and further comprising synchronically altering the polarizations of the signal sent out on the sub channels.

28. (New) The method according to claim 21, and further comprising synchronically altering the polarizations of the signal sent out on the sub channels.

29. (New) The method according to claim 22, and further comprising synchronically altering the polarizations of the signal sent out on the sub channels.

30. (New) The method according to claim 20, and further comprising exchanging among each other in predetermined intervals of time the polarizations of the signals sent out on the sub channels.

31. (New) The method according to claim 21, and further comprising exchanging among each other in predetermined intervals of time the polarizations of the signals sent out on the sub channels.

32. (New) The method according to claim 20, and further comprising assigning to each signal sent out on the sub channels a polarization selected by chance from a volume of predetermined polarizations.

33. (New) The method according to claim 21, and further comprising assigning to each signal sent out on the sub channels a polarization selected by chance from a volume of predetermined polarizations.

34. (New) The method according to claim 20, and further comprising:

sending at least some of the radio signals that are sent out on the MlMO channel by a means of digital multithread; and

modulating the radio signals sent out by means of the digital multithread, whereby for the duration of at least one bit of the multithread the polarizations of the signals sent out on the sub channels remain same.

35. (New) The method according to claim 21, and further comprising:

sending at least some of the radio signals that are sent out on the MlMO channel by a means of digital multithread; and

modulating the radio signals sent out by means of the digital multithread, whereby for the duration of at least one bit of the multithread the polarizations of the signals sent out on the sub channels remain same.

36. (New) The method according to claim 20, and further comprising:

sending at least some of the radio signals that are sent out on the MIMO channel; and

modulating those radio signals by a digital multithread, whereby the polarizations of the signals sent out on the sub channels change at least once during the duration of at least one bit of the multithread.

37. (New) The method according to claim 21, and further comprising:

sending at least some of the radio signals that are sent out on the MIMO channel; and

modulating those radio signals by a digital multithread, whereby the polarizations of the signals sent out on the sub channels change at least once during the duration of at least one bit of the multithread.

38. (New) The method according to claim 20, and further comprising

determining the polarization of the signals sent out on the sub channels by the relationship of the amounts of its performances *a* and/or (1-*a*) and/or its mutual phase situation and/or its time offset $(t_1, t_2)$.

39. (New) .The method according to claim 21, and further comprising determining the polarization of the signals sent out on the sub channels by the relationship of the amounts of its performances *a* and/or (1-*a*) and/or its mutual phase situation and/or its time offset ($t_1$, $t_2$).

40. (New) The method according to claim 20, wherein the polarizations are switchable and the number of switchable polarizations is at least as large as the number m of sub channels.

41. (New) The method according to claim 21, wherein the polarizations are switchable and the number of switchable polarizations is at least as large as the number m of sub channels.

42. (New) A device for operating MIMO air interfaces in mobile communications systems, the device comprising:

a transmitting device for transmitting a radio signal over a MIMO air interface comprised of number m of sub channels;

a receiving device for the reception of the radio signal;

facilities for the assignment of different polarizations to the radio signal that is to be sent out and received on the sub channels; and

a superimposed antenna constructed from several spatially closely adjacent partial antennas to which all the differently polarized radio signals from the sub channels are conducted.

43. (New) The device according to claim 42, wherein the partial antennas have phase centers which coincide.

44. (New) The device according to claim 42, wherein the antenna is a cross dipole.

45. (New) The device according to claim 43, wherein the antenna is a cross dipole.

46. (New) The device according to claim 42, wherein said facilities comprise means to change the phase situation and/or the time delay (t) of the radio signals.

47. (New) The device according to claim 43, wherein said facilities comprise means to change the phase situation and/or the time delay (t) of the radio signals.

48. (New) The device according to claim 44, wherein said facilities comprise means to change the phase situation and/or the time delay (t) of the radio signals.

49. (New) The device according to claim 42, wherein said facilities comprise means for dividing the radio signal into several partial signals of various performance *a* and 1-*a*.

50. (New) The device according to claim 43, wherein said facilities comprise means for dividing the radio signal into several partial signals of various performance *a* and 1-*a*.

51. (New) The device according to claim 44, wherein said facilities comprise means for dividing the radio signal into several partial signals of various performance *a* and 1-*a*.

52. (New) The device according to claim 42, and further comprising a control facility to control the installations.

53. (New) The device according to claim 43, and further comprising a control facility to control the installations.

54. (New) The device according to claim 44, and further comprising a control facility to control the installations.